REMARKS/ARGUMENTS

Claim Rejections — 35 U.S.C. § 102(e)

Claims 12-17: 35 U.S.C. § 102(e) Rejections

Claims 12-17 have been rejected under 35 U.S.C. § 102(e) as supposedly being anticipated by U.S. Patent No. 6,076,078 to Camp *et al.* (hereinafter "Camp"). It should be noted that in the current set of claim amendments, dependent claims 14 and 17 are canceled, leaving independent claims 12 and 15, along with dependent claims 13 and 16, at issue.

Claims 12-17 now explicitly refer to a globalCommit carrying *application-level* information, as well as other sources of this application-level information; that is, *service invocations* (which can also be referred to as service calls and resource invocations) and registration calls. In addition, the previously used term, "information about the actual work being committed", has been replaced with the use of the term, "application-level comments" (also sometimes in the art referred to as "heuristic messages") in order to better serve to distinguish from commonly used transactional information, as is discussed *infra*.

In the field of transactional systems, it is standard practice to distinguish between the application level and the transaction level. As examples, the terminology is defined in the "Guide — Distributed Transaction Processing: Reference Model, Version 3", ISBN 1-85912-170-5, Open Co. Ltd., February 1996, which is attached to this Response as Exhibit A, and in "Technical Standard — Distributed Transaction Processing: The XA Specification", ISBN 1 87263 24 3, Open Co. Ltd., December 1991, which is attached to this Response as Exhibit B. Specifically, Exhibits A and B explain the differentiation between terms such as "Application Program" and "Transaction Manager", as well as the differentiation between the concepts of application-level information and transaction-level information.

The *transaction level* is only concerned with coordinating decisions to commit or roll-back transactions; that is, the *transaction level* is concerned with the abstract logic underlying the interplay of the individual transactions. In contrast, the *application level* alone knows what the transactions are about (e.g., booking flights, transferring money, etc.).

According to the presently claimed invention, application-level information is passed to the transaction level and is carried along on the transaction level. This information can be used for recovery in the event of a system crash. The application-level comments can be used, *for example,*

by a human operator to clean-up after a crash or failure of one or more transaction servers. Furthermore, the application-level comments may also be used by an automated system for recovery or for finding alternative solutions in case a transaction fails. Providing this information (that is, application-level comments) is not merely a matter of user convenience; rather, it makes the difference between recovery not being possible at all (that is, logically impossible, since no information is available), and recovery being possible.

In a prior-art transactional system (for example, in Camp), the registration for a globalCommit (issued by a service) only carries an identifier (or address), such as Camp's "token", which will later allow the service to be reached for either a commit or an abort. If any additional information about the transaction is passed, this may be a global transaction identifier or a root ID; however, this information is still from the *transaction* level. *No information from the application level is passed.*

Similarly, according to the prior art such as Camp, a globalCommit message only carries information for identifying the services that are addressed, and the information whether to commit or to abort, and perhaps a global transaction identifier. *Again, no information from the application level is passed by the tokens in Camp.*

Accordingly, the Applicant respectfully requests that the Examiner withdraw all of the 35 U.S.C. § 102(e) rejections of claims 12-17.

Claims 18 and 20: 35 U.S.C. § 102(e) Rejections

Independent claim 18 and its dependent claim 20 have been rejected under 35 U.S.C. § 102(e) as supposedly being anticipated by U.S. Patent No. 6,0457,065 to Rich *et al.* (hereinafter "Rich").

These rejections are flawed because features taught in the currently amended claim 18 are not taught by Rich. Specifically, Rich does not specify the extent to which shared resource access is desired, allowed, or denied among descendant transaction invocations of the root invocation or user and other, concurrent transaction invocations which also descend from the same root.

Claim 18 teaches that "the root invocation (transaction) propagates the concurrency preferences with each or any child invocation it makes; and wherein the propagated concurrency preferences at any level in the root invocation's invocation hierarchy specify the extent to which shared resource access is desired or allowed or denied among descendant transactional

invocations of the root invocation or user and other, concurrent transactional invocations who are also descendants of the same root."

In the latest rejection, the Examiner seems to misconstrue the meaning of the terms involved: That is, committing/discarding a transaction cannot be read on allowing/denying access to a resource. One can be allowed to have access to a resource without actually committing to a given transaction. Similarly, denying access to a resource to someone does not even necessarily give the user the ability to initiate a transaction in the first place, let alone discard that transaction. Therefore, because Rich does not teach all of the limitations of claim 18, the Examiner's rejection should be reversed.

Likewise, dependent claim 20 incorporates the limitations of independent claim 18. Because claim 18 is allowable, it necessarily follows that claim 20 is also allowable.

Accordingly, the Applicant respectfully requests that the 35 U.S.C. § 102(e) rejections of claims 18 and 20 be withdrawn.

Claim Rejections — 35 U.S.C. § 103(a)

Claims 6-7: 35 U.S.C. § 103(a) Rejections

Independent claim 6 and its dependent claim 7 have been rejected under 35 U.S.C. § 103(a) as supposedly being obvious in view of a two-way combination of Rich and U.S. Patent No. 6,272,515 to Fouquet (hereinafter "Fouquet").

Unfortunately, the rejections fail to address the main point made by the Applicant in the Applicant's June 13, 2008 response to the previous Office Action dated December 13, 2007 — that Rich does not show "each process making scheduling and recovery decisions independent of any centralized component", which is a further characterization of the preceding claim limitation, "each transaction local thereto is independently handled at the process".

Starting at Numbered Paragraph 14 (page 16-17) of the final Office Action, the Examiner once again asserts that Rich supposedly shows independently handled transactions. Specifically, the Examiner "interprets that statements each transaction has an independent view of an object and the actions performed on transactions are isolated as meeting the requirements of the limitation which states 'each transaction local thereto is independently handled at the process'." The Examiner has somehow decided that piecing together Col. 10, lines 31-41, of Rich with Col. 13, lines 8-14, of Rich somehow equates to the last two elements of claim 6.

However, the Applicant respectfully suggests that the Examiner's take on Rich is misplaced. Rich does not disclose actions performed *on* transactions being isolated; rather, Rich discloses actions *by transactions on* objects. The Examiner-cited passages in Rich (specifically, col. 10, lines 31-41, and col. 13, lines 8-14) should be viewed in light of the col. 14, lines 6-29, of Rich, cited below, which shows that this view is not supported:

> Thus by providing each transaction, and each subtransaction (when appropriate), its own view of a replicated object, each transaction and subtransaction is able to see a completely independent representation of the replicated object that is isolated from any other transaction and subtransaction. In this manner, actions performed relative to a replicated object can be isolated to the transaction or subtransaction performing the actions. Similarly, if a transaction or subtransaction is cancelled, any modifications made to the replicated objects being used are cancelled along with modifications made by child transactions, yet any changes made by a higher-level subtransaction in the transaction do not have to also be cancelled.
> ...
> The present invention uses versioning of replicated objects to provide these independent views within the scope of a transaction. According to this approach, multiple versions of a replicated object may be used internally in an application program; each transaction and subtransaction may then have independent versions of a replicated object to represent the changes made by that transaction or subtransaction. These multiple internal versions are managed using views, where each transaction and subtransaction may have its own view of a replicated object.
>
> [Emphasis added.]

Similarly, in col. 13, lines 4-5, Rich recites, "isolating changes to objects between transactions".

Thus, Rich discloses "isolating changes to objects between transactions", or put another way, that it is ***objects*** that have independent representations and that can be viewed separately by different transactions. It is however ***not*** disclosed that each ***transaction*** local to a process is independently handled at the process, and that each process makes scheduling and recovery decision independent of any centralized component. While Rich isolates changes to objects, Rich does not say "actions performed on transactions are isolated".

On the contrary, Rich discloses, for example, that "if a transaction or subtransaction is cancelled, any modifications made to the replicated objects being used are cancelled along with modifications made by child transactions." This means that, even if *arguendo*, even if the Examiner's apparent equating of a process in claim 6 with an "object" in Rich is accepted, the decision on whether to cancel the transactions associated with the child (replicated) objects of

Rich are controlled by a centralized component — the child components have no autonomy to make that decision for themselves.

Further, in Numbered Paragraph 18 of the final Office Action, the Examiner cites Rich as "each transaction and subtransaction is able to see a completely independent representation of the replicated object" and from this the Examiner infers "Since the transactions are not completely independent, . . .". However, the Examiner's inference is not logically valid. Therefore, the far more specific claim 6 limitation, "each process making scheduling and recovery decisions independent of any centralized component," is simply not disclosed by Rich.

Turning to the Fouquet reference, Fouquet does not disclose *non*concurrent transactions; rather, Fouquet discloses ***concurrent transactions*** which may call ***nonconcurrent operations*** (col. 2, line 62 to col. 3, line 8).

Careful reading of the cited text shows that "Three transactions [T1, T2, T3] can be initiated in parallel" and goes on to explain how operations used by these concurrent transactions are handled in order to avoid a conflict between the operations. The operations cannot be considered to be transactions, since they do not exhibit transactional behavior.

Furthermore, even if this were the case, then further review of Fouquet shows that the three example transactions T1, T2, T3 shown in Fig. 2 are not children of the same invoking transaction. Rather, they are shown in Fig. 2 to be side by side, and unrelated by, for example, a parent transaction. Consequently, Fouquet does not show the claim 6 limitation:

> each process characterized in that if the first transaction and the second transaction conflict but are both children of a same invoking transaction, then the first transaction and the second transaction are not executed concurrently;

The purpose of Fouquet is to handle operations that by their nature cannot be executed concurrently; for example, because they interact with the same data (col. 1, lines 37-41). The purpose of the present claimed method is to prevent conflicts between child transactions that are called by the same invoking transaction.

On page 17 of the final Office Action, the Examiner asserts that Fouquet, col. 4, lines 45-51, discloses "distributed transactions" and the Examiner further asserts, *without support*, that "it is well-know[n] that distributed transactions come from an initial parent transaction." The Examiner's position apparently assumes that there can never be, in the art, parallel, independent distributed transactions that are not related by a common governing parent transaction, despite the fact that this is what Fouquet discloses in Fig. 2. The transactional conflicts discussed in

Fouquet are among ***unrelated*** children of ***different*** roots. In fact, in a distributed transactional system, transactions can originate by a number of unrelated parents, which is the main reason for the existence of (distributed) transactional systems. Conversely, in the presently claimed invention, the transactional conflicts are among related child transactions of the ***same*** root. Notably, the Examiner failed to address the Applicant's arguments regarding the example transactions T1, T2, and T3 in Fig. 2 of Fouquet, which was included in the Applicant's response to the previous Office Action, and which is repeated, *supra*.

For all the above reasons, claim 6 should be allowed. Likewise, dependent claim 7 incorporates the limitations of independent claim 6. Because claim 6 is allowable, it necessarily follows that claim 7 is also allowable.

Accordingly, the Applicant respectfully requests that the Examiner's 35 U.S.C. § 103(a) rejections of claims 6 and 7 be withdrawn.

Claims 8-9: 35 U.S.C. § 103(a) Rejections

Independent claim 8 and its dependent claim 8 have been rejected under 35 U.S.C. § 103(a) as supposedly being obvious in view of a two-way combination of Rich and Fouquet.

The Examiner's rejections assert that the two-way combination of Fouquet and Rich supposedly allows the concept of a counter being related to operations to be applied to the nested operations of Rich. However, even if this application is made and the Fouquet counter is applied to the nested transactions of Rich, this combination does still not disclose:

> propagating from a first process to a second process a message indicative of a globalCommit operation with respect to a root transaction, said message also indicative of a number or identifying list of transactional invocations which the first process has made to the second process on behalf of the root transaction;
>
> within the second process, comparing the number or list indicated in the message with a count or list within the second process of the number or list of transactional invocations which have been made on behalf of the root transaction;
>
> in the event the comparison yields a non-match, aborting the transaction.

The Examiner expresses the view (page 9 of the final Office Action) that the above-cited claim limitations are supposedly taught by Fouquet. However, what Fouquet actually discloses is that:

> [A] counter Cp(PyTx) is associated (block 33) with each particular operation (Py) of the current transaction Tx for which a particular number of conflicting

> operations has been identified and the value of the counter associated with a particular operation (block 33) is set to indicate the number of operations conflicting with the latter.
>
> (See Fouquet, col. 3, lines 31-36.)
>
> and
>
> The value of the counter associated with this particular operation is decremented (block 35) as and when operations conflicting with the latter terminate (i.e. during the execution of older transactions), reported to the transactional monitor by the reception of an event EvPy(Tz) (block 34), until there are no more conflicting operations. When there are no more operations conflicting with the particular operation, the particular operation can be activated.
>
> (See Fouquet, col. 3, lines 45-53.)

That is, the counter controls an operation, which is part of a transaction, and serves to decide if and when just one particular potentially conflicting operation (part of a transaction) may be activated.

The undersigned has diligently studied Fouquet and has been unable to find the claim limitations which the Examiner says may be found in Fouquet. Given the portions of Fouquet quoted above, the undersigned fails to understand how the above-cited claim limitations can be found in the Fouquet disclosure.

In the fifth paragraph on page 9 of the final Office Action, the Examiner asserts that "it would have been obvious to utilize the step of determining whether to abort the transaction as disclosed by Fouquet with the distributed transactions of Rich". This is a misstatement of Fouquet, since Fouquet, as previously discussed, does not disclose aborting a transaction, but rather the activation of an operation, depending on the counter.

The Examiner continues to fail to point out where the claimed features related to the counter are supposed to be in Fouquet. Rather, in Number Paragraph 15 of the final Office Action, the Examiner merely offers a sweeping, *unsubstantiated* statement that the "counter of Fouquet is considered to meet these limitations since it keeps track of the transactions and conflicting transactions." Motivated by *In re Ahlert and Kruger*, 165 USPQ 418 (CCPA 1970), the applicant invites the Examiner to show support for the Examiner's statement.

In the presently claimed invention, said number/counter serves to decide whether or not global commit of the root and all its subtransactions is aborted, which is neither disclosed nor suggested by Rich or Fouquet, nor by the combination of the two references. Therefore, the

Examiner's rejection of claim 8 cannot be sustained, and claim 8 should be allowed.

Similarly, dependent claim 9 incorporates the limitations of independent claim 8. Because claim 8 is allowable, it necessarily follows that claim 9 is also allowable.

Accordingly, the Applicant respectfully requests that the Examiner's 35 U.S.C. § 103(a) rejections of claims 8 and 9 be withdrawn.

Claim 10: 35 U.S.C. § 103(a) Rejections

Independent claim 10 has been rejected under 35 U.S.C. § 103(a) as supposedly being obvious in view of a two-way combination of Rich and Fouquet.

The Examiner asserts that the two-way combination of Fouquet and Rich supposedly allows the concept of a counter being related to operations to be applied to the nested operations of Rich. However, even if this application is made and the Fouquet counter is applied to the nested transactions of Rich, this combination does still not disclose:

> propagating from a first process to a second process a message indicative of a globalCommit operation with respect to a root transaction, said message also indicative of a number or list of invocations which the first process has made to the second process on behalf of the root transaction;
>
> within the second process, comparing the number or list indicated in the message with a count or list within the second process of the number or list of invocations which have been made on behalf of the root transaction;
>
> in the event the comparison yields a match, proceeding with the globalCommit operation.

The Examiner expresses the view (page 9 of the final Office Action) that the above-cited claim limitations are supposedly taught by Fouquet. However, what Fouquet actually discloses is that:

> [A] counter Cp(PyTx) is associated (block 33) with each particular operation (Py) of the current transaction Tx for which a particular number of conflicting operations has been identified and the value of the counter associated with a particular operation (block 33) is set to indicate the number of operations conflicting with the latter.
>
> (See Fouquet, col. 3, lines 31-36.)
>
> and
>
> The value of the counter associated with this particular operation is decremented (block 35) as and when operations conflicting with the latter terminate (i.e. during

the execution of older transactions), reported to the transactional monitor by the reception of an event EvPy(Tz) (block 34), until there are no more conflicting operations. When there are no more operations conflicting with the particular operation, the particular operation can be activated.

(See Fouquet, col. 3, lines 45-53.)

That is, the counter controls an operation, which is part of a transaction, and serves to decide if and when just one particular potentially conflicting operation (part of a transaction) may be activated.

The undersigned has diligently studied Fouquet and has been unable to find the claim limitations which the Examiner says may be found in Fouquet. Given the portions of Fouquet quoted above, the undersigned fails to understand how the above-cited claim limitations can be found in the Fouquet disclosure.

In the second paragraph on page 11 of the final Office Action, the Examiner asserts that "it would have been obvious to utilize the step of determining whether to abort the transaction as disclosed by Fouquet with the distributed transactions of Rich". This is a misstatement of Fouquet, since Fouquet, as previously discussed, does not disclose aborting a transaction, but rather the activation of an operation, depending on the counter.

The Examiner continues to fail to point out where the claimed features related to the counter are supposed to be in Fouquet. Rather, in Number Paragraph 15 of the final Office Action, the Examiner merely offers a sweeping, *unsubstantiated* statement that the "counter of Fouquet is considered to meet these limitations since it keeps track of the transactions and conflicting transactions." Motivated by *In re Ahlert and Kruger*, 165 USPQ 418 (CCPA 1970), the applicant invites the Examiner to show support for the Examiner's statement.

In the presently claimed invention, said number/counter serves to decide whether or not global commit of the root and all its subtransactions is proceeded with, which is neither disclosed nor suggested by Rich or Fouquet, nor by the combination of the two references. Therefore, the Examiner's rejection of claim 10 cannot be sustained, and claim 10 should be allowed.

Accordingly, the Applicant respectfully requests that the Examiner's 35 U.S.C. § 103(a) rejection of claim 10 be withdrawn.

Claim 11: 35 U.S.C. § 103(a) Rejections

Independent claim 11 has been rejected under 35 U.S.C. § 103(a) as supposedly being

obvious in view of a two-way combination of Rich and Fouquet.

The Examiner asserts that the two-way combination of Fouquet and Rich supposedly allows the concept of a counter being related to operations to be applied to the nested operations of Rich. However, even if this application is made and the Fouquet counter is applied to the nested transactions of Rich, this combination does still not disclose:

> propagating from a first process to a second process a message indicative of a globalCommit operation with respect to a root transaction, said message also indicative of a number or list of invocations which the first process has made to the second process on behalf of the root transaction;
>
> within the second process, comparing the number or list indicated in the message with a count or list within the second process of the number or list of invocations which have been made on behalf of the root transaction;
>
> in the event the comparison yields a non-match, aborting the transaction.

The Examiner expresses the view (page 9 of the final Office Action) that the above-cited claim limitations are supposedly taught by Fouquet. However, what Fouquet actually discloses is that:

> [A] counter Cp(PyTx) is associated (block 33) with each particular operation (Py) of the current transaction Tx for which a particular number of conflicting operations has been identified and the value of the counter associated with a particular operation (block 33) is set to indicate the number of operations conflicting with the latter.
>
> (See Fouquet, col. 3, lines 31-36.)
>
> and
>
> The value of the counter associated with this particular operation is decremented (block 35) as and when operations conflicting with the latter terminate (i.e. during the execution of older transactions), reported to the transactional monitor by the reception of an event EvPy(Tz) (block 34), until there are no more conflicting operations. When there are no more operations conflicting with the particular operation, the particular operation can be activated.
>
> (See Fouquet, col. 3, lines 45-53.)

That is, the counter controls an operation, which is part of a transaction, and serves to decide if and when just one particular potentially conflicting operation (part of a transaction) may be activated.

The undersigned has diligently studied Fouquet and has been unable to find the claim

limitations which the Examiner says may be found in Fouquet. Given the portions of Fouquet quoted above, the undersigned fails to understand how the above-cited claim limitations can be found in the Fouquet disclosure.

In the fourth paragraph on page 12 of the final Office Action, the Examiner asserts that "it would have been obvious to utilize the step of determining whether to abort the transaction as disclosed by Fouquet with the distributed transactions of Rich". This is a misstatement of Fouquet, since Fouquet, as previously discussed, does not disclose aborting a transaction, but rather the activation of an operation, depending on the counter.

The Examiner continues to fail to point out where the claimed features related to the counter are supposed to be in Fouquet. Rather, in Number Paragraph 15 of the final Office Action, the Examiner merely offers a sweeping, *unsubstantiated* statement that the "counter of Fouquet is considered to meet these limitations since it keeps track of the transactions and conflicting transactions." Motivated by *In re Ahlert and Kruger*, 165 USPQ 418 (CCPA 1970), the applicant invites the Examiner to show support for the Examiner's statement.

In the presently claimed invention, said number/counter serves to decide whether or not global commit of the root and all its subtransactions is to be aborted, which is neither disclosed nor suggested by Rich or Fouquet, nor by the combination of the two references. Therefore, the Examiner's rejection of claim 11 cannot be sustained, and claim 11 should be allowed.

Accordingly, the Applicant requests that the Examiner's 35 U.S.C. § 103(a) rejection of claim 11 be reversed.

Claims 24-37: 35 U.S.C. § 103(a) Rejections

Independent claim 23 and its dependent claims 24-37 have been rejected under 35 U.S.C. § 103(a) as supposedly being obvious in view of a two-way combination of Rich and U.S. Patent No. 6,233,585 to Gupta *et al.* (hereinafter "Gupta").

As previously discussed in the Applicant's June 13, 2008 response to the Office Action dated December 13, 2007, it is appreciated that the Examiner is entitled to give claims their "broadest reasonable interpretation." It is respectfully suggested, however, that the Examiner treats independent claim 23 as if the terms "local" and "remote" were interchangeable, or perhaps as if the terms were not present in the claim at all. To do so would, it is suggested, go beyond the "broadest *reasonable* interpretation." Though the Applicant does not feel that an amendment is needed, claim 23 is currently amended to attempt to make this distinction clearer

for the Examiner.

The Applicant respectfully requests that the currently amended claim 23 be interpreted so that the terms "locally" and "remote" are indeed treated as distinct words, thereby limiting the scope of claim 23 and all of its dependent claims. This is the most reasonable treatment of these terms, which are commonly used within the art and are treated distinctly within the art. Claim 23, thus interpreted, is respectfully suggested to be distinguishable from prior art.

Similarly, dependent claims 24-37 incorporate the limitations of independent claim 23. Because claim 23 is allowable, it necessarily follows that claims 24-37 are also allowable.

Accordingly, the Applicant respectfully requests that the Examiner's 35 U.S.C. § 103(a) rejections of claims 23-37 be withdrawn.

Conclusion

The Applicant respectfully requests that all claim rejections be withdrawn and that a Notice of Allowance be issued.

Respectfully submitted,

/s/
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